

## Was Human Evolution Caused by Climate Change?

ScienceDaily (Mar. 15, 2012) — According to a paper published in *Science*, models of how animal and plant distributions are affected by climate change may also explain aspects of human evolution.

The approach takes existing knowledge of the geographical spread of other species through the warming and cooling of the ice ages to provide a model that can be applied to human origins.

"No one has applied this knowledge to humans before," said Dr John Stewart, lead author on the paper and researcher at Bournemouth University.

"We have tried to explain much of what we know about humans, including the evolution and extinction of Neanderthals and the Denisovans (a newly discovered group from Siberia), as well as how they interbred with the earliest modern populations who had just left Africa. All these phenomena have been put into the context of how animals and plants react to climate change. We're thinking about humans from the perspective of what we know about other species."

Climate is believed to be the driving force behind most of these evolutionary processes, including geographical range change. It dictates which species are where at what time, driving their geographical spread or contraction.

Dr Stewart continued: "Ultimately, this model explains why *Homo sapiens* as a species are here and the archaic humans are not."

The research also leads to interesting conclusions as to how and why Neanderthals, and indeed the Denisovans, evolved in the first place.

"One of the models we've formulated is that the adoption of a new refugium (an area of refuge from the harsh



*Neanderthals at the cave site of Trou Al'Wesse in Belgium, clinging on as climate deteriorated. (Credit: Digital painting by James Ives)*

climatic conditions of the Ice Age) by a subgroup of a species may lead to important evolutionary changes, ultimately leading to the origins of a new species. In fact this could apply to all continental species, whether animals or plants" said Dr Stewart.

Co-author Professor Chris Stringer of the Natural History Museum, London, said: "These ideas may well explain how new human species such as *Homo antecessor* and *Homo neanderthalensis* evolved in Eurasia. The concept of refugia may also explain why the hypothesised interbreeding events between modern humans and Neanderthals and Denisovans occurred in the south of Eurasia rather than further north."

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### Journal Reference:

1. J. R. Stewart, C. B. Stringer. **Human Evolution Out of Africa: The Role of Refugia and Climate Change**. *Science*, 2012; 335 (6074): 1317 DOI: [10.1126/science.1215627](https://doi.org/10.1126/science.1215627)

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Bournemouth University (2012, March 15). Was human evolution caused by climate change?. *ScienceDaily*. Retrieved March 30, 2012, from <http://www.sciencedaily.com/releases/2012/03/120315152514.htm>

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